

REMARKS

Reexamination and reconsideration in view of the foregoing amendments and following remarks is respectfully solicited.

Claims 1, 2, 4-22, 24, 26, 27, 29, 30, 32-38, 40, 41, and 43-48 are pending in this application. The Applicants thank the Examiner for allowing claims 1, 2, 4-15, 17-19, 22, 24, 26, 27, 29, 30, 32-38, 40, 41, and 43-48. No claims have been added.

Rejections Under 35 U.S.C. § 103(a)

The Examiner has rejected claims 16, 20, and 21 as allegedly being unpatentable over U.S. Patent No. 6,733,908 to Lee et al. ("Lee") in view of U.S. Patent No. 6,207,295 to Stowell et al. ("Stowell"). On pages 4-5 of the Office action, it is further alleged that it would be obvious to combine Lee and Stowell because Stowell "teaches that alternating layers can be 0.05 to 1.2 microns (column 4 line 5-10). The upper range of 1.2 microns overlaps with the lower range of applicant's claimed range, and the range given in Lee of 1 to 500 microns (Lee col. 8 line 59-62)." The Applicants respectfully disagree.

First, it appears that the Applicants and the Office action have erroneously relied on a misstatement that Lee teaches a range of 1 to 500 microns (Lee col. 8 line 59-62). However, that cited portion of Lee actually reads:

The following experimental procedure was used to prepare and evaluate the performance of the samples discussed in the following examples. The EBC's were applied by plasma spraying onto sintered, monolithic SiC (Hexoloy™,

Thus, nowhere is there any mention of a range of 1 to 500 microns. Instead, it appears that the only section of Lee that does give ranges is in the paragraph above the one cited. That paragraph reads:

The thickness of the bond layer 18 ranges from 5 to 125 μm , in particular from 25 to 75 μm . The thickness of the mullite-containing layer 20 ranges from 25-400 μm , in particular from

125 to 250 μm . The thickness of the outer chemical barrier layer 22 ranges from 25-400 μm , in particular from 125 to 250 μm . The thickness of the optional mullite inner chemical barrier layer 24 ranges from 5 to 125 μm , in particular from 25 to 75 μm . The thickness of the YSZ outer layer 14 ranges from 25 to 400 μm , in particular from 125 to 250 μm .

See col. 8, ll. 46-56. As one can see, nowhere is there any lower limit of 1 micron or upper limit of 500 microns. Instead, the lowest limit of any of the layers is 5 microns.

Secondly, even if Lee did teach a range of 1 to 500 microns, it would not be obvious to combine Lee with Stowell. Lee teaches a multi-layer system that includes a substrate 12, a bond layer 18, a mullite-containing layer 20, an outer chemical barrier layer 22, an optional mullite inner chemical barrier layer 24, and a YSZ outer layer 14. See id. Following the teaching in Lee that the multi-layer coating includes at least the mullite-containing layer 20, the outer chemical barrier layer 22, and a YSZ outer layer 14, see col. 6, ll. 18-28, the minimum total thickness of the coating would be 75 microns. In contrast, Stowell teaches “a total outer coating thickness in the range of 2.5-25 microns.” See col. 3, ll. 37-39. In fact, Stowell specifically teaches against a thickness of greater than 25 microns and states that “a total outer portion thickness of greater than 25 microns resulted in film stresses sufficiently high to result in spalling of the outer coating portion as a result of the cyclic operating conditions of the hot operating turbine section of a gas turbine engine.” See col. 3, lines 58-61.

At best, even if the multi-layer coating only included the outer chemical barrier layer 22 that Lee teaches may comprise a rare earth silicate (e.g. RE_2SiO_5) and has a thickness that ranges from 25-400 microns. See id. The overlap of the Lee range and Stowell range does not allow the two references to be combined, because Stowell teaches against including a thickness of greater than 25 microns.

Moreover, Stowell teaches away from Applicant’s claimed range of about 1 to 20 microns for a first oxygen barrier layer and the range of from about 1 to 100 microns for first and second isolation layers. Specifically, Stowell states that “it is preferred that each of the alternating layers has a thickness in the range of about 0.02-1.2 microns...At a thickness greater than about 1.2 micron, detrimental nodules of material tend to form in a layer.” See col. 4, lines 6-12.

Examiner is well aware of the three basic criteria necessary to establish a prima facie case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success, and third, the prior art reference or references must teach or suggest all the claim limitations. The teaching or suggestion to make the combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure. In *Re Vaeck*, 947 Fed. 2d 488, 20 USPQ 2d, 1438 (Fed. Cir. 1991). Here, there is no suggestion or motivation to combine Lee and Stowell and the references do not teach each and every element of claims 16 and 20. It is therefore respectfully submitted that claims 16 and 20, and all claims depending therefrom, are in condition for allowance.

Conclusion

Based on the above, it is respectfully submitted that the independent claims now present in the application are patentable over the citations of record. The dependent claims are also deemed patentable for the reasons given above with respect to the independent claims and because each recite features which are patentable in its own right. Individual consideration of the dependent claims is respectfully solicited.

The other art of record is also not understood to disclose or suggest the inventive concept of the present invention as defined by the claims.

Hence, Applicants' submit that the present application is in condition for allowance. Favorable reconsideration and withdrawal of the objections and rejections set forth in the above-noted Office Action, and an early Notice of Allowance are requested.

If the Examiner has any comments or suggestions that could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the below-listed number.

Appl. No. 10/644,523

Reply to Office Action of April 25, 2007

If for some reason Applicant has not paid a sufficient fee for this response, please consider this as authorization to charge Ingrassia, Fisher & Lorenz, Deposit Account No. 50-2091 for any fee which may be due.

Respectfully submitted,

INGRASSIA FISHER & LORENZ

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By: /CINDY H. KWACALA, REG. NO. 47667/

Cindy H. Kwacala
(480) 385-5060